Osaca, the great commercial emporium of the Empire, and thence overland to Yeddo. The usual obstructiveness on the part of Japanese officials and the feudal lords or Damios was displayed on this occasion, and overcome, not without danger of a collision, by the firmness of Mr. Alcock. It was essential that his journey should be made, for the time was fast approaching when these ports were to be opened to foreigners, and information on their capabilities had to be obtained. The result was that Osaca appeared beyond a doubt to be the most promising site in Japan for the principal seat of foreign commerce.

THE PRESIDENT commended the author in an earnest manner for his highly-interesting sketch of the social condition of Japan.

THE PRESIDENT then called the attention of the Fellows to the proposal of M. Jules Gérard to establish an African Society for explorations south-west from Algeria; and, having complimented his associates on the increasing prosperity of the Royal Geographical Society, he adjourned the meetings till November next.

ADDITIONAL NOTICES.

(Printed by order of Council.)

1.—*The "Herald's" Voyage*, 1852-61. By CAPTAIN DENHAM, R.N., F.R.S.

(See p. 195.)

IN 1851 strong representations were made to Her Majesty's Government respecting both the rapidly-increasing traffic between our Australian colonies and the western coast of America, and our inadequate knowledge of the intervening navigation among the insulated rocks and intricate clusters of islands which extend to the eastward of New Caledonia. It was urged also that distant commerce and maritime enterprise would derive great benefit from a thorough examination of that region, from having its dangers fully explored, and from having its harbours so charted and described that the seaman would know where he could either obtain supplies or repair for refit or refuge, or endeavour to fix his whaling or his coaling stations. An exploring and surveying voyage was accordingly undertaken in 1852, which, under Admiralty instructions, from time to time was conducted by Captain Henry Mangles Denham, of the Royal Navy, in Her Majesty's ship *Herald*, until 1861, when she was recalled in consideration of so long an absence from England.

The hydrographic results of this voyage being *transmitted annually*, the existing charts were forthwith corrected, and several new ones published, together with such hydrographic papers as would *at once* give the maritime world the benefit of those results; and, in due course, the original matter, franked by the Duke of Somerset as First Lord of the Admiralty, and by Admiral Washington as the Admiralty Hydrographer, is now laid before this

Society; comprising 163 determinations of latitudes and longitudes, 2601 magnetic results, 41 islands, 42 reefs and shoals, 22 barrier-reef prongs, 450 miles of Australian coast-line, with the estuaries Shark Gulf, Port Jackson, Moreton Bay, and the Derwent of Tasmania, 700 miles' contouring of the main bank, the edge of soundings off Capes Good Hope and Agulhas, thence along the Australian coast, and around the Lord Howe, Norfolk, and Kermadec islands; 107,000 miles of ship-track notations of depths, winds, currents, ocean temperatures, meteorology, and natural history, with the researching evidence upon which twenty-three *vigias* (or fabulous reefs) were expunged. The detail of the above is set forth in the 144 charts and plans, together with 93 illustrative drawings, and 15 sheets of tabulations, also submitted to inspection.

The free use of the deep-sea lead throughout the passages out and home led to the delineation of certain ocean-banks of soundings in the South Atlantic; one of which (the Victoria) in 20° 45′ S., 37° 47′ W., rises abruptly from no soundings to 19 fathoms, is of coralline structure, and spreads 80 miles by 12, attracting the fin-back whale, and affording haddock-fishing. The *Herald* was anchored for several days on these banks.

It was on the passage out that, in 37° S., and 37° W., about midway between Tristan d'Cunha and Buenos Ayres, soundings were obtained in 7706 fathoms, and other opportunities were taken of testing the depth at which the minimum temperature of the ocean is to be found (vide tabulation). The results shewed 41° as near the surface as 600 fathoms (although the surface-water was at the temperature of 80°), 40° at 900 fathoms, and not of lower temperature at 1500 fathoms.

The deep-sea lead frequently going, *always ready*, and the hand-leads *constantly going* when intersecting the assigned positions of vigias, precluded our mistaking earthquake tremor of the ship (as it will though out of soundings) for "grazing over a shoal." Tremors were experienced by the *Herald* (her leads *going*) when in the vicinity of the alleged *Equator shoals*, between the meridians of 21° and 22° W., affording reason for expunging such unnecessary terrors from our charts as the "Purdy shoals" of 1831 and 1842.

The region of the *Herald's* special exploration very soon became suggestive of a distinct oceanic designation, and that of "Western Pacific" was adopted, implying all that space embraced by the meridians 150° and 180° E. between the Equator and 45° S.

By determining the salient positions both of the islands and reefs belonging to the New Caledonia, Loyalty, New Hebrides, Fijian, and Tonga groups on the *north*, and also of Lord Howe, Norfolk, and the Kermadec islands, with the warning banks of soundings, which range about the parallel of 30° S., a clear passage is indicated of 300 miles wide for the first 1600 miles directly eastward of Australia. On this track the harbour of Matuku (the southernmost island of Fiji) is of easy access; it is adapted for a coaling-station; while the chiefs and a Christianized population present every facility.

Having mapped all that space embraced by New South Wales, New Zealand, Kermadec group, Tonga, Fiji, New Hebrides, and New Caledonia, so as to open up the first stage of communication between our Australian colonies and Western America, and having landed and established the Pitcairners at Norfolk Island, a detail survey of the Fiji group was taken in hand, which, however, had to be relinquished (when only its south-western section had been delineated upon a 3-inch scale), to meet the demand for a similar development of the Coral Sea as that which this expedition had wrought directly eastward of Australia; in the course of which Captain Denham traced the fate of Mr. Benjamin Boyd, of the R.Y.S. yacht *Wanderer*, and punished his murderer at Guadalcana, of the Solomon group. The space to which Captain Denham's researches were then directed, is bounded to the westward by the great barrier-reef of Australia, and to the north-eastward by New Caledonia, Solomon Islands, and the Louisiade range—the trends of which converge to Torres

Strait. This coral sea, heretofore beset with vaguely-charted dangers, and rendered the more perplexing by many *reported* reefs, caused sad disasters, which, however, did not deter voyagers, who looked upon a *north-western* route to India as a great facility for ships of Tasmania, Melbourne, New Zealand, Sydney, and Queensland. In due course, however, this sea, with its isolated reefs (coming abruptly awash, though with no soundings around), became mapped; and now presents a clear 1200-mile route (free of current, and within the steady south-east trades), of 150 miles width; a route which may be availed of upon but three successive courses—viz. N. by W. ¾ W. 240 miles, N.W. ½ W. 700 miles, and W. ½ N. 220 miles—after crossing the parallel of 25° S., upon the meridian of 156° E., until sighting the (about to be lighted) Raine Island tower in Torres Strait. None of the six reefs (Cato, Wreck, Kenn, Lihou, Osprey, Willis) on the western hand, nor the Bellonas, Bampton, and Mellish reefs, on the eastern hand, need be neared; but, to give confidence, and to help a crippled ship to a sheltered anchorage,—which, happily, these reefs afford,—the Colonial Governments entertain Captain Denham's proposition of lighting Cato, Kenn, and Raine; in the same spirit his suggestions were adopted by the New South Wales Government regarding the coast-lights, beacons and buoys. The detailed examination of the reefs was such as to reveal their refuge capacities; and although 350 miles from land, light-house establishments can be formed and maintained (each having a cay free from surf, on sufficiently solid coralline substratum), and the landing of supplies would be easier accomplished than at our Eddystone or Smalls! each reef has upon its north-western and *leeward* aspect an eight-fathom shelf of fine coral grit. The plan-charts of these reefs, with a masthead look-out, will enable the cruiser or whaler to round-to under their lee, to all the succour of a Portland or Plymouth Breakwater,—at once clear of a turbulent sea-way,—where she may caulk topsides, set up rigging, rate chronometers, obtain turtle, fish, and seafowl-eggs, and enjoy the priceless tropical comfort of open ports and scuttles. This "coral sea" development indicated such postal and commercial benefits as suggested the compliment of designating it the "Denham Route:" for, by it, and through Torres Strait, steamers of one-half the size now employed to round Cape Leeuwin, can make the passage to Singapore in smooth water in one-fifth less time. Nor is it restricted to western monsoons for shipping to get to the *southward* through the Coral Sea, as the *Herald* worked the passage, against the south-eastern monsoon and trade, in twenty-six days.

To afford immediate, though temporary, means of "making-out" some of the more salient of these reefs, beacons were erected from the *débris* of wrecks and the *Herald's* stores so far as they would admit; while, with a view to permanent improvement, and for the sake of visitors or castaways, cocoa-nuts, shrubs, grasses, and every description of seed likely to grow and self-plant, were sown in the way most likely to clothe and promote the superstructure. These "cays," situated above high-water level, become the resort for seafowl to lay their eggs, and, as the birds die off, guano is produced and a vegetation is promoted that bids fair to render these ocean spots available refuges. Bottled-up papers were always left by the *Herald*, giving the latitude and longitude, and the course and distance to the nearest port, with such provisions, match-boxes, &c., and cooking-utensils, as could be spared, or had been collected from the wrecks fallen in with.

In 1858, the favourable season (January to June) for a sailing-passage along the southern aspect of Australia, and for a sojourn upon its western coast, was employed in determining the question as to Shark Bay being adapted for forming a settlement. Its position, and configuration of harbours on the maps extant had suggested it as a position for a penal settlement. The survey of this gulf was therefore prosecuted to the extent of its tidal interstices, which ramify over 400 miles of coast-line; its estuaries, however, were found to be intercepted by shallows only to be penetrated by the marine surveyors' step-by-step

process; and eventually the region proved to be such a tissue of negatives as but ill-requited the time and toil expended upon its examination; for neither timber, water, nor stone, could be found near its shores; and but a few Natives were at last seen at the head of the innermost estuary, who meekly accepted biscuit and water (caring for nothing else of ours), they having but mud-bags to suck, and a thin parsnip-sort of root to eat. The utterly destitute character of this region being determined by the beginning of June, when the dry moderate weather is quickly succeeded by storms — the furrowing effects of which, as traceable upon the semi-indurated sandhills, would indicate its being subject to hurricane visitations,—the *Herald* cleared this "gulf of negatives," with her last month's short allowance of water, on the 5th of June, 1858; the first 600 miles (being a *sailing* ship) was on the port-tack to the westward; but when in 32° s. and 104° E., she gradually got upon her 2600-mile track for Sydney (viâ Bass Strait), reaching it on July 12th for supplies. She was soon again in the Coral Sea, clearing up its capacity as a route; and this being accomplished by October, 1860, she sailed homeward by Torres Strait, determining its middle passage, settling the position of its western dangers (Cook's Straits, Proudfoot, &c.), and then proving that the parallel of Booby Island, 10° 36′ s., is a clear track down the "Arafura" sea, until abreast of Timor, when the soundings jump so abruptly from 100 to 12 fathoms, as to demand a "good look-out," and to indicate a bottom adverse to submarine telegraphic connexion of Australia by its north-western Cape.

Track-chart notations, as in the passage out, were continued viâ Java, Madagascar, Cape of Good Hope, St. Helena, Ascension, passing over certain reported shoals in 1000 fathoms, making the passage, with obvious advantage to a *sailing* ship (in the season of English Channel *easterly* winds), to the *eastward* of the Azores; and, on the 7th of May 1861, closing the operations of this expedition in 777 fathoms, 52 miles outside the edge of soundings.

2.—*Extracts from Narrative of a Journey through the Interior of Japan from Nagasaki to Yeddo, in* 1861. By RUTHERFORD ALCOCK, F.R.G.S., Min. Plen. and Consul-General in Japan. (See p. 197.)

A PAPER was read in this Society last season, giving some account of my journey in the interior of Japan, which was undertaken for the ascent of the mountain of Fusiyama, and with the further purpose of visiting the sulphur-springs of Atami. I had intended giving an equally detailed narrative of the incidents and principal objects of general and scientfic interest which came under my notice during a much more extended exploration of the interior of the country in a journey I undertook last year about this time, from Nagasaki to Yeddo, across the island of Kinsin, through the inland sea to Hiogo and Asaca, the great commercial emporium of the empire, and thence overland to Yeddo, the capital of the Tycoon. I have unfortunately, however, arrived in England much too late in the season to give effect to this purpose now, and I owe, indeed, to the obliging courtesy of the President and Council the opportunity of presenting to the Society even the very brief and imperfect sketch now before me, and for which I must beg the indulgence of all who are willing to listen to it. Fortunately in my previous paper I gave such details of the general features of the country, the usual incidents of travel in Japan, and the social state and physical geography of the districts then traversed, that, to those who were present, or who may since have read it in the 'Transactions of the Society,' any repetition of such details would be superfluous, and they will be prepared without any further preface to take their place in the motley caravan which formed my cortège on the 1st of June last year, and start at